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Investigation of winter cereal crops development based on their spectral reflectance properties

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Abstract

The article presents the results of analysis of winter cereals spectral reflectance characteristics obtained using remote sensing data. The samples of sowings typical of the Belgorod Region and the Central Black Earth Region were used for the research. The experimental data were received from 158 sowing areas. It has been established that the difference in sowing time has more influence on the difference in winter cereals phenophases occurrence than on the over-wintering conditions. Snow melting in the fields on certain dates of the winter period can be clearly identified in NDVI seasonal trajectories values. The influence of sowings growth after the winter period on vegetation index values is shown using ground data. NDVI variation coefficient value and test of hypothesis for normal distribution in certain time slices may serve as criteria defining the uniformity degree of biophysical parameters of plants growing in various sowing areas. During the periods when the phases of development are leveled, sharp decreases in random variation and standard deviation are observed. It has been established that the maximal homogeneity of vegetation cover and green phytomass of the sowings is observed from the second half of May until mid-June. The minimal values of NDVI variation coefficient (5-6%) calculated for each analyzed date at an interval of 16 days are observed in mid-June.

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Keywords

Landsat, MODIS, NDVI, Remote sensing, Vegetation, Winter cereals